

work will profit. Papers on educational subjects will be read at the spring meeting, which is to take place in the middle of April at the Girls' Grammar School, Bradford.

OLD residents of the California peninsula have noticed several varieties of birds near the sea coast that they have never before known to leave the mountains. This is supposed to indicate a severe winter, but the migration is more probably due to the prevailing scarcity of all kinds of seeds in the mountains this season.

ACCORDING to the report of the captain of a vessel which in December returned from Eskefjord, on the east coast of Iceland, showers of ashes fell on Eastland early in November. The deck of the ship was covered with a thin layer of ashes, probably caused by a volcanic eruption inland.

MR. W. HEWITT, Science Demonstrator to the Liverpool School Board, writes to us with reference to the "Itinerant" method of science teaching. The special instruction is, in Liverpool, he states, commenced with the children in the fourth standard, and by this means deals with more than double the number of children who would be included were the commencement deferred until the fifth standard, as appears to be the case in Birmingham. There is every reason to believe, Mr. Hewitt thinks, that the preliminary instruction in the fourth standard is a very important part of the intellectual training which it is the object of the system as a whole to give. The stages of instruction in each subject are kept quite distinct throughout, and are always taken in the same order. The children on commencing the subject take up the first stage, and proceed in the following year to the second stage, and so on through a systematic and carefully-graduated three (or four) years' course of instruction in elementary science.

THE hatching of lobster and fish is making great progress in Norway. Thus, last year the Association for the Promotion of the Norwegian Fisheries hatched 7,000,000 fish, chiefly cod and haddock, at their establishment of Arendal, in the Christiania fjord, and this winter between 50,000,000 and 60,000,000 more will probably be turned out. The experiments, which were made of placing the ova of lobster in hatching apparatus, have been attended with great success, and show that they may be turned out by the million in this manner. As private enterprise cannot be expected to undertake these operations from year to year on a large scale all along the coast, the Association have petitioned for Government support, which will, it is expected, be readily forthcoming, as the Norwegians now clearly see of what enormous benefit to the nation these operations are.

MR. NEWALL asks us to state that in his note on "The Jeannette Drift" (vol. xxxi. p. 102), the word *knots* should be *nauts*, a *naut* being a geographical mile of 60 to a degree. It is a much more convenient measure than the mile of 1760 yards, for it contains 1000 fathoms, or ten cables of 100 fathoms each, as used in the navy. It is the only decimal measure used in any Government department! *Knot* is a mark on a line used on board ship, having the same proportion to a *naut* which a half-minute glass has to an hour, or the  $1/120$ th part of a *naut*; so, when 10 knots pass out during one turn of the glass, the sailor means that the vessel is passing through the water at 10 nauts an hour.

THE additions to the Zoological Society's Gardens during the past week include a Golden Eagle (*Aquila chrysaetos*) from Sutherlandshire, presented by Col. E. D. Hunt; a Crossbill (*Loxia curvirostris*), British, presented by Mr. C. Skegg; seven Bramblings (*Fringilla montifringilla*), two Chaffinches (*Fringilla caelebs*), a Tree Sparrow (*Passer montana*), a Black-headed Bunting (*Emberiza melanocephala*) from Norfolk, presented by Mr. T. E. Gunn; a Nilotic Crocodile (*Crocodilus vulgaris*) from Africa, presented by Mr. H. E. Cree; a Brush-tailed Kangaroo

(*Petrogale penicillata* ♂) from New South Wales, a Golden-crowned Conure (*Conurus aureus*) from South-East Brazil, deposited; two Striated Tanagers (*Tanagra striata*) from Buenos Ayres, two Siskins (*Chrysomitris spinus*), British, purchased; a Virginian Fox (*Urocyon virginianus*) from North America, received in exchange.

### OUR ASTRONOMICAL COLUMN

COMETS OF SHORT PERIOD. (1) ENCKE'S COMET.—The following ephemeris of this comet for February is founded upon Dr. Backlund's elements, which the January observations show to be very exact:—

At 6h. Greenwich Mean Time

1885	R.A.	Decl.	Log. distance from Earth	Log. distance from Sun
h. m. s.	h. m. s.			
Feb. 1 ... 23 33 0 ...	+6 32'4			
2 ... — 34 31 ...	6 38'6	...	0'0884	9'9279
3 ... — 36 3 ...	6 44'7			
4 ... — 37 35 ...	6 50'7			
5 ... — 39 8 ...	6 56'4			
6 ... — 40 40 ...	7 2'1	...	0'0705	9'8901
7 ... — 42 13 ...	7 7'5			
8 ... — 43 45 ...	7 12'7			
9 ... — 45 17 ...	7 17'5			
10 ... — 46 49 ...	7 21'9	...	0'0490	9'8478
11 ... — 48 20 ...	7 25'8			
12 ... — 49 50 ...	7 29'2			
13 ... — 51 18 ...	7 31'9			
14 ... — 52 44 ...	7 33'9	...	0'0233	9'8003
15 ... — 54 7 ...	7 34'9			
16 ... — 55 26 ...	7 34'9			
17 ... — 56 41 ...	7 33'7			
18 ... — 57 52 ...	7 31'1	...	9'9924	9'7470
19 ... — 58 57 ...	7 26'9			
20 ... 23 59 54 ...	7 20'7			
21 ... 0 0 42 ...	7 12'4			
22 ... — 1 20 ...	7 1'4	...	9'9555	9'6881
23 ... — 1 46 ...	6 47'5			
24 ... — 1 57 ...	6 30'1			
25 ... — 1 51 ...	6 8'9			
26 ... — 1 25 ...	5 43'2	...	9'9123	9'6263
27 ... 0 0 36 ...	5 12'4			
28 ... 23 59 22 ...	+4 35'0			

(2) BARNARD'S COMET.—Dr. Berberich, of Berlin, has made a new determination of the orbit of this comet from three normal positions deduced from observations extending over a period of three months. The sidereal revolution is now found to occupy 1958'9 days, or 5'363 years. In heliocentric longitude  $343^{\circ} 40'$ , the distance of the comet from the orbit of Mars is only 0'0079, and a revolution but slightly differing from that obtained by Dr. Berberich would have caused a very close approach of the two bodies as lately as the end of 1873 or beginning of 1874. The distance of the comet at aphelion from the orbit of Jupiter is 0'572. As previously remarked, much interest attaches to this comet from the similarity of the elements of its orbit to those of "the lost comet of De Vico," observed in the autumn of 1844.

(3) WOLF'S COMET.—Dr. Tempel, writing from Arcetri on the 4th inst., describes this comet as being still "sehr hell mit leicht zu beobachtendem Kerne." Considering that accurate observation commenced on September 20, the mean motion may be expected to be pretty exactly defined by the observations at this appearance, and the comet's orbit previous to the near approach to the planet Jupiter in 1875 may be investigated, with probability of a reliable result, without waiting for observations at its next return to perihelion in 1891.

### GEOGRAPHICAL NOTES

THE *Bulletin de la Société de Géographie* for the last quarter of 1884 is largely occupied with the geography of the Far East. Two members of the foreign mission body communicate papers on Tonquin, both accompanied by maps. Père Pinabel writes on some "savage peoples" dependent on Tonquin. The expression "savage" is explained to mean nothing more than mountaineers. The tribes here described inhabit the mountains of the province of Thague-hoa, between the rivers Maa and Chou, which is the most southern province of the delta of the Red

River, and not far from the Annamite border. The tribes called Phon-tays, live in a sort of semi-independence, like the Laos tribes, in the mountains on the Siamese frontiers. A third tribe inhabiting the region is called by Père Pinabel the Méos (Moïs?), and are said by him to be in all probability the aboriginal Miao-tsze of South-Western China, although whether he has any ground for this belief beyond the resemblance of the names does not appear. At any rate, it is evident from their customs and language that they are Chinese. A fourth tribe is called the Sas, of whom nothing appears to be known except that it fled to the borders of Annam during one of the numerous wars of that region. A long and tolerably detailed account of the manners and customs of the Phon-tays is given, and shorter ones of those of the Moïs and Sas. They are all the more interesting that the writer appears to have no idea of ethnology, and therefore is not on the look-out for parallels elsewhere, but records everything with simplicity and directness. Père Blanck's experiences lay also in the Laos States, on the frontiers of Siam and Tonquin, but to the south of those of his colleague. His paper is simply a record of his journeys among the "savages" in the mountains between the province of Nghé-Ane, the most southern province of Tonquin bordering on Annam, and the Mei Kong River. Both these papers are taken from the reports of the *missions étrangères*. M. du Cailland describes the Quang-si, or Kwang-si, the province of China adjoining Tonquin, and that from which the greater part of the Chinese invading force is drawn. The writer discusses the routes from Langson into China, the river-system of Kwang-si, its administrative divisions, its ethnography, recent history, and the Catholic propaganda there. According to M. du Cailland, the Chinese population there is nothing more than a colony of Cantonese amongst the vast numbers of Miao-tsze and Laos in the western portion. Unfortunately, the writer has omitted his authorities for this statement, although his references in other portions of the paper are somewhat copious. It would be of great interest to learn on what grounds the wealthiest and most populous province but one of Southern China is believed to be only a Cantonese colony, while the Miao-tsze, who are generally believed to exist only in small and weak communities scattered over the central part of South-Western China, are masters of this vast district. The geography and ethnography of China must be rewritten, if M. du Cailland is accurate in this portion of his paper.—M. Huber continues his account of his journey in Central Arabia, which has been already noticed.—Prince Roland Bonaparte describes fourteen voyages to the coasts of New Guinea, made by Dutch Government vessels, between 1876 and 1883. They went chiefly from Ternate. Each voyage is described in detail, apparently from official sources. The conclusion of the paper is that it is easy to see from this account that the Dutch have annexed in a definite manner the eastern part of New Guinea to their empire in the Malay Archipelago.—M. Simonin discusses the progress of the Australian colonies commercially and politically.

At the last meeting of the Gesellschaft für Erdkunde in Berlin (January 3) Dr. Steinmann read a paper on his journeys in Southern Patagonia. In 1882 he went as geological assistant to the fourth German expedition to Punta Arenas, mainly with the object of studying the Southern Cordilleras. What struck him particularly here was the extraordinary difference in the plant forms to those on the Southern Cordilleras, while on the western slopes vegetation is rich in forms, the climate of the steppes reigns on the eastern side. From a geological point of view, the southern point of America is extremely simple in its build, but it is of a different character on the east and west. On the east chalk formations occur almost entirely, while on the west, where there are innumerable islands, there is nothing but granite and crystalline rocks. Although the configuration of the coast has been studied thoroughly by the English, Dr. Steinmann thinks that many important questions have still to be settled; for instance, whether Laguna Blanca, lying to the north-east of the settlement Kyrsing Water, has an outlet to the sea. Ultimately the lecturer reached the Laguna of the third settlement of Santa Cruz, of which it may with certainty be said that was connected until recently with the Pacific Ocean. It may also be concluded that at that time the mainland was much more cut up by channels and waterways than it is now. In May 1883 Dr. Steinmann visited, in the company of Fuegian seal hunters, the islands south of the Straits of Magellan, including Tierra del Fuego. Ultimately, he made his way from the southern point of America to Bolivia, and here continued his investigations.

THE Society of Naturalists in St. Petersburg has received permission to despatch several of its members to join the Russian representatives on the Afghan Boundary Commission, with the view to the scientific exploration of Central Asia. The English Commission, which is now on the spot, has, it will be remembered, a geologist, a naturalist, and topographers amongst its number.

THE *Daily Telegraph* is publishing a series of articles descriptive of the Kilimanjaro expedition, "by its leader," Mr. H. H. Johnston. They are full of interesting detail.

WITH the commencement of the new year *L'Exploration* has taken a new form and a new title. It is now called *La Gazette géographique et l'Exploration*, and is about double its former size, the pages being larger and arranged in double columns. We trust that with this improvement there may be a corresponding advance in its usefulness as a geographical journal.

Petermann for January contains an article and map on the journey of the pundit A—R— in Eastern Thibet during the years 1878-82. Dr. Richard Lüdtke writes on the Italian emigration of 1883 from official sources. France takes nearly half of the emigration to European countries, while the State of La Plata and North America take the largest share of the extra-European emigration. Dr. Pauli writes on the Cameroons, and Herr Regel describes a journey from Charjui by Merv to Pandj, and back to Samarkand.

#### GEOLOGY OF AFGHANISTAN

THE *Times*, in the letter from its correspondent with the Afghan Boundary Commission, publishes the following notes supplied by Mr. Griesbach, of the Indian Geological Survey:—

"The hill ranges between Kushkak and Pahlri in the Herat valley are all apparently composed of rocks belonging to the Cretaceous and younger periods. So far as I could judge, the ranges are formed by a series of parallel anticlinal folds of the Upper Cretaceous rocks, which in this part of Afghanistan (as in a great part of Persia) are hippuritic beds. They are mostly limestones, dark gray to white, and contain fossils in abundance, among which several species of hippurites are the commonest. The igneous rocks which play such an important part within the hippurite area in the Candahar district were also met with here under exactly the same conditions. Basic rocks (trap) are intimately connected with the Cretaceous limestones in this area also, and it would be impossible to distinguish them on anything but a very detailed geological map. Here also the limestone near the contact with the trap (and other igneous rocks) has been converted into a white, fine-grained marble, much used by the natives of Southern Afghanistan for monumental purposes. But by far the most interesting of the igneous rocks is a syenitic granite which appears in several patches. The Karez-i-Dasht is composed entirely of this rock, which is seen to be capped by trap in the surrounding hill ranges. Its age is most probably younger than that of the trap through which it has burst. This group of rocks, with the exception of patches of younger Tertiary rocks, form all the ranges up to and including part of the Chillingak range and pass (near Pahlri). The latter range, in which the conspicuous Doshakh peaks are situated, is of great geological interest. It is an anticlinal fold, the centre and northern axis of which is formed by Palæozoic rocks; so far, I have only been able to detect Carboniferous fossils in a series of dark blue limestone beds, but it is quite possible that older groups are also there. The ravine leading to the high points south of Robat-i-Pai Ziarat has excavated its course through Carboniferous beds only. The beds dip north and below the younger gravels and fan deposits of the Heri Rud. But on the right bank of the valley, rocks appear again of an entirely different look, and it is quite possible that members of the lower Mesozoic system are represented there. The southern flank of the Chillingak range is formed only by Cretaceous beds—sandstones and shales of the Kojak type, overlaid with hippuritic limestone near Pahlri. The connection of these beds with the Palæozoic strata of the centre is quite hidden. The older river deposits and Dasht beds are clays, sandstone, and conglomerates much of the same character as already described from the Helmund. They form thick deposits south of Pahlri and in the Heri Rud Valley, and I have found remains of mammalian bones in them.